

1 JUNE 1971
VOL. 21 NO. 11

Contribution No. 324
U. S. Department of Commerce
National Oceanic & Atmospheric Administration
National Marine Fisheries Service
Biological Laboratory
Galveston, Texas 77550

BioScience

American Institute of Biological Sciences

Letters	<i>J. S. Weis, L. P. Miller, C. C. Davis, C. A. Hill, B. M. Vetter, R. W. Scott</i>	504
Editorial	Flora North America: A Data Bank for Systematic Biology, <i>D. M. Gates</i>	507
Articles	ABSTRACTS	509
	Floristics in Europe, <i>D. H. Valentine</i>	512
	Floristics in the USSR, <i>A. A. Fedorov</i>	514
	The Flora North America Project, <i>R. L. Taylor</i>	521
	Flora North America as an Information System, <i>S. G. Shetler</i>	524
	Summary Statement on North Temperate Floristics, <i>R. F. Thorne</i>	533
Education	Good Cheer for Sorry Times?, <i>D. L. Abell</i>	534
	The Challenge of Environmental Education, <i>E. M. Hafner</i>	535
Features and News	Profile: Fernbank Science Center, <i>W. G. Peter III</i>	537
	PANORAMA	540
	CAPITOL COMMENT	542
	PEOPLE AND PLACES	544
	CALENDAR	545
Books	REVIEWS	547
	Fisheries (<i>J. L. McHugh</i>), p. 547; Root Fungi (<i>T. Kommedahl</i>), p. 547.	
	Photobiology (<i>C. D. Miles</i>), p. 548; Plant Biophysics (<i>J. H. McClendon</i>), p. 548; Radiation Biology (<i>A. P. Jacobsen</i>), p. 548.	
	Functional Anatomy (<i>A. E. Wood</i>), p. 549; Oceanography and Limnology (<i>L. T. Spencer</i>), p. 549.	
	Genetics of the Potato (<i>M. D. Rumbaugh</i>), p. 550; Insect Defense Mechanisms (<i>A. K. Sparks</i>), p. 550; Environmental Education (<i>A. Nelson</i>), p. 550.	
	NEW TITLES	551
Employment		552
Advertising Index		552
Cover Photo	The red-spotted newt (<i>Notoophthalmus</i> sp.) showing the "Red Eft" stage. The generic name of the organism was recently changed from <i>Dicamptylus</i> to <i>Notoophthalmus</i> which means "black eye." The two newts pictured were observed on the slopes of Grandfather Mountain, North Carolina. Photo by J. R. Pounds and Marvin Williams, North Carolina State University, Raleigh.	

BioScience, the official publication of the American Institute of Biological Sciences, 3900 Wisconsin Ave., NW, Washington, D.C. 20016, is published twice monthly. Institutional subscription prices: \$18.00 a year domestic (including Canada and Pan America); \$20.00 a year all other foreign. Single copies: \$1.50. Individual subscriptions to BioScience are not available except through membership in the AIBS. © 1971. American Institute of Biological Sciences. Second class postage paid at Washington, D.C.

The author has directed his book towards the beginning biologist or the interested non-biologist. He expresses the hope that even those who are not professional biologists will allow their minds to consider this subject matter. Although there are a number of new ecology and ecologically oriented texts on the market today, Russell-Hunter's book should fill a partly empty niche. The book's only defect is that the use of technical terminology without an accompanying glossary might defeat the interested reader before he has become fascinated by the topic.

LARRY T. SPENCER
Plymouth State College of the
University of New Hampshire
Plymouth

GENETICS OF THE POTATO

Genetics of the Potato, Solanum tuberosum, by H. W. Howard, Springer-Verlag, Inc., New York, 1970, 126 p., illus., \$8.60 (73-130343).

Choice of subject matter and its development in monographic form necessarily are highly personal decisions by authors. Dr. Howard is eminently qualified to make these decisions with respect to one of the world's important food crops, potatoes. His research and publications, including two surveys of potato genetics, attest to that fact. In the preface of this book the author points out that it differs from the earlier reviews in three ways: (1) it is confined largely to tetraploid cultivated species, (2) genetics is interpreted in a much stricter sense, and (3) the number of references has been cut drastically.

The result is a short (97 pages), informative, and very useable account of current knowledge of the genetics of *Solanum tuberosum* L. As the book jacket states, "The book is essential reading for research workers on the potato and for geneticists and economic botanists; it will also be of value to, for example, botanists and plant breeders in a more general context." This monograph does fill a void, but I regret its brevity. It would have been even more valuable if Dr. Howard had chosen to both amplify and extend the scope of his writing to match that of his earlier reviews. Chapter 1 contains a section entitled "Cultivated potato species" in which the topic is summarized with less than a page of type. Surely a discussion of the botanical origin of this important food plant as comprehensive as that recently presented by Ugent¹ would greatly have enhanced the value of the monograph for most readers.

Potato breeders may feel that certain aspects of their interests have been slighted. The discussion of tuber numbers, size, and yield is inadequate and based on a single paper published in 1957². This is counterbalanced by excellent treatments of disease and insect resistance and of the use of

dihaploids in improvement programs. I believe Chapter 9, Chimeras, to be the best of the work.

The author assumes the reader is familiar with basic facts of polyploid genetics and cytogenetics. This is appropriate for a monograph. Most books have a few typographical errors and this one proved not to be an exception. All were minor and did not cause difficulty in understanding the text. The price (\$8.60) seems somewhat excessive considering the size, paper quality, and lack of photographs. However, the major fault of this volume is that there should be more of it.

References

1. Ugent, Donald. 1970. The potato. *Science*, 170: 1161-1166.
2. Engel, K. H. 1957 Grundlegende Fragen zu einem Schema für Arbeiten mit Inzuchten bei Kartoffeln. *Züchter* 27: 98-124.

M. D. RUMBAUGH
South Dakota State University
Brookings

INSECT DEFENSE MECHANISMS

The Cellular Defense Reactions of Insects, by G. Salt, Cambridge University Press, American Branch, New York, 1970, 118 p., illus., \$11.50 (71-118067).

The cellular mechanisms of defense in insects are succinctly but adequately summarized in this small monograph, so strikingly unaffected it can easily be read in a single sitting.

I was intrigued with the author's comments on the anatomical characteristics of insects and the type of defense mechanism which evolved as a result. Because any organism entering the body through the exoskeleton or the gut wall must enter the haemocoel, defense mechanisms are centered in, or even restricted to, the haemocoel, and Salt contends that infections of tissues elicit no haemocytic reactions if the connective tissue covering remains intact.

The simplicity of the cellular defense mechanisms, at least as Salt interprets them, contrasts markedly with those of vertebrates and many invertebrates. The haemocytes react to any solid surface other than fellow blood cells and autologous connective tissue; phagocytosing particles small enough to be engulfed and encapsulating those too large to be phagocytosed by a single cell. The two processes combine in nodule formation where clumps of bacteria or other foreign particles are encountered. Salt contends that there is no evidence supporting chemotaxis of insect blood cells and that the limited evidence available suggests that haemocytes react only when they accidentally contact a foreign body. He explains the cohesion of haemocytes to those haemocytes in contact with a

foreign body in capsule formation to changes in the cell surface of the underlying cells.

While Salt is convincing in his presentation, I suspect some insect pathologists may not agree completely with him. I feel very strongly indeed that there is some, albeit unknown, stimulus in most invertebrates (e.g. oysters and earthworms) responsible for the rapid, massive infiltration of reactive cells to areas of injury or sites of foreign bodies. This is not to dispute Salt's thesis in regard to insects, but simply to emphasize the variation in cellular defense mechanisms in invertebrates of divergent phylogeny and different anatomical architecture.

I think this book will attract a catholic audience; it is of value to invertebrate pathologists, and insect pathologists. I can think of no place the beginning insect pathologist could obtain the basic understanding of the reaction to injury in insects in as clear and concise form as in this monograph. It should also be of value to the general entomologist who is interested in defense mechanisms of insects, but does not wish to invest the time and money necessary to encompass the broad field of insect pathology. My only complaint lies with the illustrations. The drawings, while adequately illustrating the desired points, are diagrammatic and all the micrographs are at the ultrastructural level. I would have preferred photomicrographs in place of many of the drawings, but this may be a personal idiosyncrasy of one who derives aesthetic pleasure from viewing a high quality photomicrograph.

ALBERT K. SPARKS
National Marine Fisheries Service
Biological Laboratory
Galveston, Texas

ENVIRONMENTAL EDUCATION

Teaching for Survival, A Handbook for Environmental Education, by M. Terry, Friends of the Earth/Ballantine, New York, 1971 (paper).

This book is written primarily for secondary school teachers, but is valuable for the elementary school teacher, the college teacher, and the layman as well. In general, Mr. Terry shows how environmental education can be incorporated into the educational system and cites specific problems to illustrate certain points.

The short, first section of the book contains a philosophy of environmental education and includes a chapter on overuse and overgrowth. The second part deals with the classroom, the school, and the school district as environments. Rather than discussing subject matter or curriculum, he writes about philosophies, policies, and activities general to any classroom, school, or district setting. In essence, he is asking the students, teachers, and administrators to look at how resources and the environment are affected by the